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ABSTRACT

The Chapter 1 English-as-a-Second-Language (ESL) program provided supplementary, intensive English language instruction to limited-English-proficient (LEP) students in 69 non-public schools in New York City. The program's primary goal was to help LEP students gain the listening, speaking, reading, and writing skills necessary to improve their performance in school. Thirty-four schools received services at mobile instruction units, 13 at nearby public schools, and 7 at leased sites. Fifteen schools received computer-assisted instruction (CAI) only; in some cases, CAI was combined with face-to-face instruction. Data from document reviews, test scores, site visits, interviews with staff, and analysis of responses to a teacher survey indicate that the program met its objectives for both face-to-face and computer-assisted instruction (except for one writing subtest), with few differences found for the two modes of instruction. A variety of face-to-face and CAI teaching strategies were used. Recommendations include continued expansion of parent involvement programs, provision of face-to-face instruction for all ESL students, continued adaptation of software for situations where teachers are not present, adjustment in software companies' teacher training schedules, and investigation of the impact of lack of audio component at higher grade levels in ESL CAI. (MSE)

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OREA Report

EVALUATION SECTION REPORT

CHAPTER 1
ENGLISH AS A SECOND LANGUAGE
1988-89

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EVALUATION SECTION REPORT

John Schoener, Chief Administrator

May 1990

EVALUATION SECTION REPORT

CHAPTER 1
ENGLISH AS A SECOND LANGUAGE
1988-89

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OFFICE OF CHIEF EXECUTIVE FOR OPERATIONS
BUREAU OF NONPUBLIC SCHOOL REIMBURSABLE SERVICES

CHAPTER 1 ENGLISH AS A SECOND LANGUAGE PROGRAM
1988-89

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CHAPTER 1 NONPUBLIC SCHOOLS ENGLISH AS A SECOND LANGUAGE PROGRAM

EVALUATION SUMMARY, 1988-89

BACKGROUND

The Chapter 1 English as a Second Language (E.S.L.) program provided supplementary, intensive English language instruction to 2,445 limited English proficient (LEP) students in 69 nonpublic schools. The program's primary goal is to help LEP students gain the listening, speaking, reading, and writing skills necessary to improve their performance in school. Face-to-face services were offered to 2,012 students, and 433 received computer-assisted instruction (C.A.I.).

Students are eligible if they live in a targeted Chapter 1 attendance area and are deemed limited English proficient due to the fact that they are unable to participate in an English language achievement testing program.

Due to the 1985 Supreme Court decision that instruction by public school teachers on the premises of nonpublic schools was unconstitutional, alternative methods for providing Chapter 1 services were devised. Of the 69 schools that participated in the E.S.L. program, 34 received services at mobile instructional units (M.I.U.s), which were mobile classrooms generally parked outside the school being served; 13 received services in designated classrooms in nearby public schools; seven received services in leased neutral sites; and 15 received C.A.I.

The program was funded at $2.4 million. Staff included one coordinator, two field supervisors, and 42 teachers. Students receiving face-to-face instruction were bused or escorted to program sites. Each teacher worked with small groups of students, two to three days a week, in sessions ranging from 30 to 60 minutes. In addition, take-home projects--the Read-Along component and Take-Home Activities--provided opportunities for parental involvement in the educational process.

C.A.I. was offered in two modes of instruction: C.A.I.-only and C.A.I. with face-to-face (combination services). C.A.I.-only students worked in computer labs one to four days a week, in 30 to 50-minute sessions. Combination services students worked two days a week in computer labs and were escorted to leased neutral sites, public schools, or M.I.U.s one day a week, where they recieved face-to-face instruction.

PROGRAM OBJECTIVES AND METHODOLOGY

The objective for the 1988-89 English as a Second Language program was that students would achieve statistically significant mean gains standardized tests and the program-developed Oral

Interview Test (OIT). The tests used were the following:

- The Test of Basic Experience (TOBE) Language subtest was given to kindergarten and first grade students to measure linguistic skills in English.
- The Language Assessment Battery Reading and Writing and Listening and Speaking subtests were given to second grade students to measure reading, writing, listening and speaking skills;
- The Language Assessment Battery Reading, Writing, and Listening subtests were given to students in grades three through eight to measure reading, writing, and listening skills; and
- The Oral Interview Test (OIT) was given to students in kindergarten, grade one and grades three through eight to assess cognitive and linguistic skills.

The findings of this evaluation are based on data from document reviews, analyses of mean gains in tests scores, site visits, interviews with program staff, and analyses of responses to a teacher survey on C.A.I.

FINDINGS

Student Achievement

Face-to-face instruction. The overall mean gains on all tests for students receiving face-to-face instruction were statistically significant, meeting the program's criterion for success. In addition, overall mean gains showed continuing stability with overall gains from previous years.

Computer-assisted instruction. The overall mean gains for students receiving computer-assisted instruction were statistically significant, meeting the program's criterion for success on all tests except the LAB Writing subtest. It should be noted that there were not enough students to compute statistical significance for grades four through eight.

Contrasts of mean gains for three modes of instruction. In the majority of cases, there were no statistically significant differences between students using the different modes of instruction. In the following cases, where significant differences in mean gains did occur, these differences favored students receiving some face-to-face instruction:

- Grade two students receiving face-to-face and combination services made significantly higher gains than students receiving C.A.I.-only on the Reading and

Writing and the Listening and Speaking subtests of the LAB; and

- On the OIT, the mean raw score gain for students receiving face-to-face instruction and combination services were significantly higher than for those receiving C.A.I.-only.

It should be noted that the gains reported for combination services are of limited usefulness for grades three through eight. Only twelve of 181 students were both pretested and posttested, since the rest of the students came on-line with C.A.I. too late in the school year to evaluate these test score gains.

Program Implementation

Face-to-face instruction. The E.S.L. teachers implemented a variety of teaching strategies derived from a richly diverse staff development program. Teachers reported positive results from the use of the Read-Along component. In addition, increased parental involvement was implemented through the use of Take-Home Activities.

Computer-assisted instruction. In order to comply with the Supreme Court's 1985 ruling, Chapter 1 teachers are not present in the nonpublic school computer labs. Instead, they monitor instruction via modems from the program's administrative center. Trained noninstructional technicians are present in the computer labs to maintain and operate the equipment, and ensure order and safety.

Three-hundred and eighty C.A.I. students received instruction via software packages for E.S.L. instruction. The majority of these students, 199, received C.A.I.-only, while 181, about 40 percent, received a combination of face-to-face and C.A.I. (combination services).

Instructional software was adapted to the Chapter 1 curriculum by Chapter 1 staff and staff developers from the software companies:

- Since the E.S.L.-C.A.I. curriculum includes items from the Reading and Mathematics software, and these software packages only have audio components for the lower grade levels, E.S.L.-C.A.I. at higher grade levels may not include an audio component.

Teacher expertise was addressed in staff development sessions with representatives from software companies. In addition, responses to a teacher survey on C.A.I. indicated that:

- The two software companies were somewhat to moderately responsive to teacher requests and suggestions.

RECOMMENDATIONS

Based on the evaluation findings and other information presented in this report, the following recommendations are made:

Face-to-Face Instruction

- Since program objectives were met by all grades on all tests, staff development and classroom instruction should continue as currently organized.

- Expansion of the parental involvement programs should continue.

Computer-Assisted Instruction

- Face-to-face instruction gave students the opportunity to practice speaking aloud, while C.A.I.-only did not include this important element of E.S.L. instruction. To provide practice in speaking aloud, some face-to-face instruction is recommended, wherever possible, for E.S.L. students. This recommendation is also suggested by the positive findings for face-to-face only students.

- Efforts should continue to adapt the instructional software for use in settings where the Chapter 1 teacher is not physically present.

- In the interest of helping teachers acquire the necessary expertise with the C.A.I. systems, software companies should adjust the schedules of their trainers to accomodate teachers who spend several days a week teaching in face-to-face settings.

- The impact of the absence of an audio component at the higher grade levels in E.S.L.-C.A.I. should be investigated.

TABLE OF CONTENTS

		PAGE
I.	INTRODUCTION	1
	Program Purpose	1
	Eligibility	1
	Delivery of Chapter 1 Services: Legal Parameters	1
	Students Served	2
	Student Participation in Other Chapter 1 Programs	4
	Program Objectives	4
	Program Evaluation	6
	Scope of the Report	6
II.	PROGRAM DESCRIPTION	8
	Program Funding and Organization	8
	Face-to-Face Instruction	8
	Additional Program Components	10
	Computer Assisted Instruction	11
	Conclusion	18
III.	PROGRAM IMPLEMENTATION	19
	The Staff Development Program: An Overview	19
	Staff Development Workshops	19
	Classroom Observations and Teacher Interviews	22
	The Read-Along Program: Teachers' Perceptions	23
	Conclusions	24
IV.	COMPUTER ASSISTED INSTRUCTION TEACHER SURVEY	25
	C.A.I. Teacher Survey Summary	32
V.	STUDENT OUTCOMES	33
	Attendance	33
	Methodology	33
	Academic Achievement Findings for Students Receiving Face-to-Face Instruction Only	35
	Academic Achievement Findings for Students Receiving Computer-Assisted Instruction	49
	Contrasts of Mean Gains for Three Modes of Instruction	58
VI.	CONCLUSIONS AND RECOMMENDATIONS	64
	Conclusions	64
	Recommendations	67

APPENDIX A: Brief Description of Chapter 1 Nonpublic Reimbursable Programs, 1988-89 69

APPENDIX B: The C.A.I. Teachers Questionnaire 71

LIST OF TABLES

		PAGE
TABLE 1:	Student Participation in the E.S.L. Program By Grade and by Years in Program, 1988-89	3
TABLE 2:	Language Background of Students in the E.S.L. Program, 1988-89	5
TABLE 3:	Student Participation in the C.A.I.-E.S.L. Program by Grade, Software Package, and Mode of Instruction	14
TABLE 4:	Teacher Ratings of Software Companies' Responsiveness	31
TABLE 5:	Mean N.C.E. Differences on the Test of Basic Experience for E.S.L. Full-Year Kindergarten and Grade One Face-to-Face Students, 1988-89	37
TABLE 6:	Mean N.C.E. Differences on Subtests of the Language Assessment Battery for Second Grade Full-Year Face-to-Face Students in the E.S.L. Program by Grade, 1988-89	38
TABLE 7:	Mean N.C.E. Differences for Full-Year Face-to-Face E.S.L. Students in Grades Three through Eight on the Language Assessment Battery Reading Subtest, 1988-89	39
TABLE 8:	Mean N.C.E. Differences for Full-Year E.S.L. Face-to-Face Students in Grades Three through Eight on the Language Assessment Battery Writing Subtest, 1988-89	41
TABLE 9:	Mean N.C.E. Differences for Full-Year E.S.L. Face-to-Face Students in Grades Three through Eight on the Language Assessment Battery Listening Subtest, 1988-89	42
TABLE 10:	Mean Raw-Score Differences for Full-Year E.S.L. Face-to-Face Students in Grades Kindergarten, One, and Three Through Eight on the Oral Interview Test, 1988-89	44
TABLE 11:	Comparison of Mean N.C.E. Differences of E.S.L. Face-to-Face E.S.L. Students in Kindergarten and Grade One on the Test of Basic Experience over Two School Years	46

TABLE 12: A Comparison of Overall Mean N.C.E. Differences for E.S.L. Students, Grades Three through Eight on the Language Assessment Battery Reading, Writing and Listening Subtests over Two School Years 47

TABLE 13: Mean Raw Score Differences of E.S.L. Students on the Oral Interview Test, Kindergarten through Grade Eight Over Four School Years 48

TABLE 14: Mean N.C.E. Differences for C.A.I.-E.S.L. Full-Year Kindergarten and Grade One Students on the Test of Basic Experience, 1988-89 50

TABLE 15: Mean N.C.E. Differences for C.A.I.-E.S.L. Full-Year Second Grade Students on the Language Assessment Battery Subtests, 1988-89 52

TABLE 16: Mean N.C.E. Differences for Full-Year C.A.I.-E.S.L. Students, Grades Three through Eight, on the Language Assessment Battery Reading Subtest, 1988-89 53

TABLE 17: Mean N.C.E. Differences for Full-Year C.A.I.-E.S.L. Students, Grades Three through Eight, on the Language Assessment Battery Writing Subtest, 1988-89 54

TABLE 18: Mean N.C.E. Differences for Full-Year C.A.I.-E.S.L. Students, Grades Three through Eight, on the Language Assessment Battery Listening Subtest, 1988-89 56

TABLE 19: Mean Raw-Score Differences by Full-Year C.A.I.-E.S.L. Students, Grades Kindergarten, One, and Three through Eight, on the Oral Interview Test, 1988-89 57

TABLE 20: Comparison of Overall Mean N.C.E. Differences for Full-Year E.S.L. Students in Kindergarten and Grades One and Two Receiving Face-to-Face Instruction, C.A.I.-Only Instruction, and Combination Services, on Norm-Referenced Tests, 1988-89 59

TABLE 21: Comparison of Overall Mean N.C.E. Differences for Full-Year E.S.L. Students in Grades Three through Eight Receiving Face-to-Face Instruction, C.A.I.-Only Instruction, and Combination Services, on the Language Assessment Battery Tests, 1988-89 61

TABLE 22: Comparison of Overall Mean Raw Score Differences for Full-Year E.S.L. Students Receiving Face-To-Face Instruction, C.A.I.-Only Instruction and Combination Services, on the Oral Interview Test, 1988-89 63

I. INTRODUCTION

PROGRAM PURPOSE

The Chapter I English as a Second Language (E.S.L.) program provides supplementary, intensive English language instruction to limited English proficient (LEP) students in nonpublic schools in New York City. The program's primary goal is to help LEP students gain the listening, speaking, reading, and writing skills necessary to improve their performance in school. The program is also designed to improve students' cognitive and conceptual abilities. The program serves students in kindergarten through eighth grade.

ELIGIBILITY

Students are eligible if they live in a targeted Chapter 1 attendance area and are deemed to be limited English proficient due to the fact that they are unable to participate in an English language achievement testing program.

DELIVERY OF CHAPTER 1 SERVICES: LEGAL PARAMETERS

On July 1, 1985, the Supreme Court held that the local educational agencies' most common method of serving Chapter 1-eligible children--instruction by public school teachers on the premises of nonpublic schools--was unconstitutional. As a result, alternative methods for providing Chapter 1 services were devised. Eligible students attending nonpublic schools now receive Chapter 1 services at mobile instructional units (M.I.U.s), public school sites, leased neutral sites, and

nondenominational schools, and via computer-assisted instruction (C.A.I.) in designated computer labs in nonpublic schools.

In order to comply with the Supreme Court ruling, Chapter 1 teachers are not present in the computer labs. Instead, they track student progress through the curriculum and assist the instructional process via modems from the Board of Education administrative center. Trained noninstructional technicians are present in the computer labs with students, to maintain and operate the equipment and ensure order and safety.

In order to further comply with the Supreme Court ruling, the hardware and software utilized for Chapter 1 students must be non-divertable; that is, it cannot be utilized in the nonpublic schools for anything but the instruction of Chapter 1 students. Therefore, the hardware/software configurations were put together with this in mind.

STUDENTS SERVED

During 1988-89, the E.S.L. program served 2,445 students from 54 nonpublic schools in grades kindergarten through eight (see Table 1). Seventy-seven percent of the students were in kindergarten through grade two. Eight percent were in grade three, and 15 percent or less were in each of the remaining grades.

Years Participated in the Program

Sixty-nine percent of the students were in their first year of E.S.L. instruction (see Table 1), 24 percent were in their second year, and 6.7 percent had been in the program for three years or more.

TABLE 1

Student Participation in the E.S.L. Program
By Grade and Years in Program, 1988-89

			Number of Years in the Program					
			1		2		3 or more	
Grade	N[a]	%	N	%	N	%	N	%
K	578	24	574	99.3	4	0.7	--	--
1	745	30	514	69.0	228	30.6	3	0.4
2	574	23	278	48.4	203	35.4	93	16.2
3	188	08	79	42.0	69	36.7	40	21.3
4	82	03	46	56.1	24	29.3	12	14.6
5	93	04	64	68.8	22	23.7	7	7.5
6	75	03	55	73.3	15	20.0	5	6.7
7	63	03	51	81.0	9	14.3	3	4.8
8	47	02	28	59.6	18	38.3	1	2.1
Total	2,445	100	1689	69.1	592	24.2	164	6.7

[a] Out of 2,445 students, 433 received computer-assisted instruction and 2,012 received face-to-face instruction.

- Over three-fourths of the participants (77 percent) were in kindergarten through grade two.
- The majority of the students (69 percent) were in their first year of program participation.
- Almost one fourth of the students (24 percent) were in their second year in the program.
- Less than a tenth of the students had been in the program three or more years.

Language Backgrounds

The grade levels and language backgrounds of E.S.L. students are illustrated in Table 2. Hispanic students constituted the largest group, 57.7 percent. Other language groups with large numbers of students included French/Haitian Creole, 15.7 percent; Greek, 5.2 percent; and Chinese, 3.4 percent.

STUDENT PARTICIPATION IN OTHER CHAPTER 1 PROGRAMS

Many students participated in other Chapter 1 nonpublic school programs. Thirty-four percent of the students were referred to the Chapter 1 Clinical and Guidance program. Students also participated in the Chapter 1 Corrective Mathematics program when there was a demonstrated need.

PROGRAM OBJECTIVES

The following objectives were to be achieved as a result of the implementation of the 1988-89 E.S.L. program:

- Kindergarten and first grade students would make statistically significant gains in normal curve equivalent units (N.C.E.s)* from pretest to posttest on the Test of Basic Experience (TOBE).
- Second grade students would make statistically significant N.C.E. gains on the Language Assessment Battery (LAB) Reading and Writing (composite score), and Listening and Speaking (composite score) tests.
- Students in grades three through eight would make statistically significant N.C.E. gains on the Reading, Writing, and Listening subtests of the LAB. Battery.

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*N.C.E. scores are similar to percentile ranks but, unlike percentile ranks, are based on an equal interval scale. Scores are based on a scale ranging from 1 to 99 with a mean of 50 and a standard deviation of approximately 21. Because N.C.E. scores are equally spaced apart, arithmetic and statistical calculations such as averages are meaningful; in addition, comparisons of N.C.E. scores may be made across different achievement tests.

TABLE 2

Language Background of Students
In the E.S.L. Program, 1988-89

	Language Background[a]									
Grade	1	2	3	4	5	6	7	8	9	Total
K	122	249	62	14	27	41	1	2	60	578
1	161	293	125	14	26	30	1	22	73	745
2	101	221	101	22	14	30	--	27	63	573
3	46	62	22	18	5	7	--	9	18	187
4	9	23	19	4	--	6	1	1	19	182
5	11	28	26	3	--	7	--	3	15	93
6	11	20	10	4	--	3	1	1	25	75
7	9	20	16	2	--	3	--	--	13	63
8	2	18	3	1	--	1	1	3	18	47
Total[b]	472	934	384	82	72	128	5	62	304	2443
%	19.4	38.3	15.7	3.4	2.9	5.2	0.2	2.5	12.4	100

[a] 1 = Spanish (Puerto Rican)
2 = Spanish (other)
3 = French/Haitian Creole
4 = Chinese
5 = Italian
6 = Greek
7 = Iranian
8 = Russian
9 = Other

[b] Information on language background was missing for two students, making a total of 2,445 students.

- The largest number of students (57.7 percent) were Spanish speaking.
- 15.7 percent of the students spoke French or Haitian Creole.
- Slightly more than a fourth of the students came from a variety of other language backgrounds.

- Students in grades kindergarten and one, and three through eight would make statistically significant gains on the Oral Interview Test (OIT).

PROGRAM EVALUATION

The purpose of the 1988-89 evaluation by the Office of Research, Evaluation, and Assessment/Instructional Support Evaluation Unit (OREA/I.S.E.U.) was to describe the implementation of the E.S.L. program and to assess its impact on student achievement in language skills. The following methods were used to conduct this evaluation:

- A review of program documents and interviews with program staff to describe program organization and funding, the curriculum, and program activities and components;
- Review of data retrieval forms containing information about grade placement, number of years in the program, frequency of contact time, and referrals to the Clinical and Guidance program;
- Analyses of students' scores on standardized and criterion-referenced tests administered in the fall and spring of the school year;
- Classroom site observations, interviews with teachers, and staff development workshop observations;
- A teacher survey was distributed to all teachers to gather information about the Read-Along program; and
- A teacher survey was distributed to the C.A.I. teachers in order to gather information about their perceptions of the C.A.I. program.

SCOPE OF THE REPORT

The purpose of this report is to describe the 1988-89 Chapter 1 E.S.L. program and assess the effectiveness of its implementation. Chapter II provides an overview of the E.S.L. program's organization and funding, including the curriculum, instructional groupings of students, and other program activities

and components. Chapter III describes program implementation, including information from observations of staff development workshops as well as classroom observations. Chapter IV describes the results of a teacher survey on computer assisted instruction. Chapter V reports on student attendance and academic achievement findings. Chapter VI offers conclusions and recommendations. The appendices include a brief description of 1988-89 Chapter 1 nonpublic school reimbursable services and a copy of the teacher survey on computer-assisted instruction.

II. PROGRAM DESCRIPTION

PROGRAM FUNDING AND ORGANIZATION

During 1988-89, the E.S.L. program was funded at $2.4 million. The staff included the program coordinator, two field supervisors, and 42 teachers. Using a pull-out approach, the program provided instruction for students from 69 nonpublic schools.

FACE-TO-FACE INSTRUCTION

Students from 69 nonpublic schools received supplemental, face-to-face E.S.L. instruction at 34 M.I.U.s, 13 public school sites, and seven leased neutral sites. Each teacher worked with an average of eight students in sessions lasting from 30 to 60 minutes. Students were scheduled for from two to five sessions each week, with most students attending two or three sessions a week.

Diagnostic-Prescriptive Instruction

Based upon the Oral Interview Test results, the E.S.L. program staff initially grouped students into the following three levels of English proficiency:

- Students who scored between 1 and 19 raw score units were placed at the beginner level;
- Students who scored between 20 and 25 raw score units were placed at the intermediate level; and
- Students who scored between 26 and 30 raw score units were placed at the advanced level.

Classroom instruction varied according to grade level and

language proficiency. Teachers continued to use a diagnostic-prescriptive approach throughout the school year to determine students' individual learning strengths and weaknesses. Lessons were designed and curriculum materials chosen to meet individual learning needs and styles.

Curriculum

The E.S.L. curriculum was designed to improve the cognitive, conceptual, and linguistic abilities of students. The targeted linguistic areas included listening, speaking, reading, and writing. Teachers used cultural and instructional materials to stimulate interaction in the classroom and encourage students' use of oral and written English in their nonpublic school classes and at home.

The curriculum is composed of eight goal levels. The three areas are taught in increasing complexity as the student progresses to higher goal levels. The following are examples selected from Goal III to provide an illustration of the contents of goal levels:

- Cognitive skills: Can name and describe, understands numerical concepts;
- Concepts: School items, letters, numbers, colors, big/small;
- Linguistic items:
  Listening and speaking: "To have" present and past forms;
  Reading: Word recognition: colors, capital letters, yes, no;
  Writing: Trace, copy, write numbers and letters.

While all four language areas were integrated in the lessons, time spent on reading and writing activities was greater at the

upper levels. Listening and speaking activities were focused upon in the early grades. In addition, students were encouraged to apply cognitive, conceptual, and linguistic skills to content areas likely to be encountered in other learning settings, for instance, mathematical concepts and geographical terms.

ADDITIONAL PROGRAM COMPONENTS

The E.S.L. program also included a Read-Along program, Take-Home Activities, and a Staff Development program.

Parental Involvement

Read-Along Program. The Read-Along program provided the opportunity for students to practice English listening and speaking skills at home at their own pace, through an individual reading experience. Their E.S.L. teachers provided them with audio cassette tapes, books, and tape recorders for home use. In order for a student to participate, a parent or other caretaker must pick up and return the audio tape recorder, which gives the teacher the opportunity for contact with the parent. Teachers orient parents on how to help their children with their at-home reading in group meetings or individually.

Twenty-one percent of the E.S.L. students were selected to participate in the Read-Along program. Students were selected on the basis of grade level and need. The read-along component reinforced the E.S.L. curriculum areas of vocabulary, language structures, thinking skills, and concept development, and gave students additional exposure to speech rhythms, patterns, and intonations. Texts used at home in conjunction with audio

cassette tapes differed for beginning, intermediate, and advanced readers. The texts included science books, mysteries, fairy tales, and storybook.

Take-Home Activities. In order to increase parental involvement in the E.S.L. program, a new component, Take-Home Activities (T.H.A.), was introduced in 1988-89. This program was instituted in all second grade classes.

T.H.A. were sent home with students with directions for parents in pictures and words. Materials included in T.H.A. kits were home picture dictionaries, crayons, pencils, a glue stick, and stickers. In a typical T.H.A. the parent talks with the child about the activity and asks the child questions about it. For instance, the parent might discuss a picture from the picture dictionary with the child, asking her questions such as, "What is this picture about?" When an activity has been completed the parent rewards the child with a sticker.

Staff Development

The E.S.L. Staff Development program was designed to help teachers enhance their professional skills and to promote increased parental involvement in the education process. Activities included workshops, classroom observations by supervisors, post-observation conferences, and occasional small group meetings.

COMPUTER-ASSISTED INSTRUCTION

Number of Schools On-Line

By June of 1989, 15 schools were on-line with a program of

computer-assisted instruction (C.A.I.). Eleven schools were added to the program during the 1988-89 school year. This means that not only was implementation proceeding for schools that went on-line in 1987-88, but also installation and staff training were carried out for the entire school year, since new schools were being added from October 1988 to May 1989. Students from nine nonpublic schools received C.A.I.-only. Students from six nonpublic schools received combination services.

Modes of Instruction

C.A.I. was offered via two modes of instruction: combination services and C.A.I.-only. The majority of students, 60 percent, received C.A.I.-only. They worked in the Chapter 1 computer labs in their nonpublic schools from one to four days a week, in sessions lasting from 30 to 50 minutes. Forty percent of the students, from six schools, received combination services. These students worked two days a week in the computer lab. In addition, once a week they were bused or escorted to a public school, a neutral site, or an M.I.U. for face-to-face instruction by the same Chapter 1 teacher who monitored their progress with C.A.I.

Computer Software and Students Served

C.A.I. was offered by two computer software companies, ESC and WICAT. The hardware configurations for each of these companies were distinct and noninterchangeable; thus a given school could only work with one software package. Nonpublic

school principals selected the software/hardware configurations for their schools. Table 3 shows the number of students served, by grade, with each of the software packages, in both modes of instruction.

Monitoring Instruction at a Distance

In order to comply with the Supreme Court ruling, Chapter 1 teachers monitor student progress and intervene in the instructional process from computer rooms at a Board of Education administrative center. The computer rooms have work stations that include both computers and printers. Not only were the computers connected via modems to the nonpublic school Chapter 1 computer labs, but there were also telephones in each room to allow the Chapter 1 teachers to speak to the non-instructional technicians who were located at the nonpublic school sites. The computer work stations were shared with C.A.I. teachers from the Corrective Mathematics and Corrective Reading programs.

The software companies provided teacher manuals which were kept in the computer rooms. These manuals contain information on the operation of the systems, software curriculum contents, and the interpretation of printouts of individual and class progress reports.

The teachers' time in the computer rooms involved the following activities:

- Reading printouts of student progress and deciding what, if any, teacher intervention with the software is required;

TABLE 3

Student Participation in the C.A.I. E.S.L. Program
By Grade, Software Package, and Mode of Instruction

			ESC		WICAT	
Grade	N	%	CAI Only[a] N	Combination Services N	CAI Only[a] N	Combination Services N
K	49	12.9	8	24	4	13
1	127	33.4	29	32	52	14
2	106	27.8	28	23	30	25
3	30	7.9	14	4	1	11
4	16	4.2	2	3	2	8
5	16	4.2	6	6	1	3
6	9	2.3	6	3	0	0
7	15	4.0	4	4	3	4
8	12	3.3	6	2	3	2
Total	380	100.0	103	101	96	80
Total Percentage		100.0	27.2	26.5	25.2	21.1

[a] Data on the software package was missing for fifty three students who received C.A.I. only, making a total of 433 students.

- 258 students, or 60 percent of the total, received C.A.I. only.
- 181 students, or 40 percent of the total, received combination services.
- Of the 380 students for whom data were available, 52.4 percent used ESC software and 47.6 percent used WICAT software.

- Preparing reports of student progress;
- Previewing student lessons;
- Communicating with noninstructional technicians and nonpublic school principals; and
- Staff development in C.A.I.

Adapting C.A.I. for Nonpublic School Chapter 1 Services

Both software packages were originally designed for learning situations which include a teacher who is physically present as students work on the computers. Therefore, a major task of both the software companies and the Chapter 1 staff has been to find ways of adapting these learning systems to a situation in which a teacher is not physically present. Teachers must not only learn the system, but they also must work with the software representatives to try to improve remediation and discover ways in which software needs to be amended. For two years, therefore, as C.A.I. has been implemented in the nonpublic schools, teacher feedback has contributed in varying degrees (depending on the company) to the software companies' development of their own product. The receptivity of software companies to teacher feedback is important, therefore, due to:

- the need to adapt C.A.I. to a situation where the teacher is not physically present; and
- the need to do this with a New York City remedial population at different grade levels.

C.A.I. Staff Development

The C.A.I. teachers, besides participating in the staff development of the E.S.L. program, also received staff development directly from the computer software companies in

C.A.I. The software company representatives had scheduled training sessions throughout the school year on specific topics, and were available in person and by phone for individual problems. The software companies also provided training to the noninstructional technicians; and hotlines were available for technical assistance.

Since schools were being brought online throughout the school year, the training task was made more complex by the differing levels of knowledge of the C.A.I. teachers. The availability, flexibility, and responsiveness of C.A.I. trainers was thus of great importance.

C.A.I. Teacher Expertise. WICAT Systems has prepared a learning improvement plan for Chapter I teachers, which is based on a model of three stages that teachers go through to become proficient users of C.A.I. The following is an abbreviated version of these stages.

Stage 1. NOVICES use the system default settings and leave control of instruction to the system.

Stage 2. PRACTITIONERS guide students through the systems, utilize reports, and control the sequence of online instruction.

Stage 3. INTEGRATORS and EXTENDERS solve learning problems and create learning opportunities beyond the normal use patterns of the system's instructional design. They find ways to use materials such as workbooks and homework assignments along with the C.A.I. in order to better meet the needs of individual students.

It can be seen from the above that successful adaptation of the C.A.I. systems to the learning needs of Chapter 1 nonpublic school students requires that the C.A.I. teachers progress to

stage 3.

C.A.I. Curriculum

Computer-assisted instruction in English as a Second Language is offered by two software companies; WICAT and ESC. When C.A.I. began to be implemented in the nonpublic schools, WICAT had an existing software package for E.S.L. instruction, although it did not match the existing Chapter 1 E.S.L. curriculum. ESC did not have an E.S.L. software package. Each nonpublic school selected the system for their students. Therefore, in order to accommodate the Chapter 1-eligible LEP students in schools whose principals had chosen ESC and WICAT, the E.S.L. staff began a collaboration with the staff developers from WICAT and ESC to put together C.A.I. packages for their E.S.L. students. As a result of these efforts, the E.S.L. curricula can be described as follows:

- For WICAT students, the WICAT- E.S.L. software package is supplemented with excerpts from WICAT's reading and mathematics packages.
- For ESC students, the E.S.L. software is actually a composite of reading and mathematics items.
- For both WICAT and ESC, the audio components are used, and they are in English. Students wear headphones as they sit at their computers, listening to tapes which go with the various software segments.
- For ESC, which did not have an E.S.L. program, the existing audio components were designed for students at lower grade levels (i.e., approximately kindergarten to grade three) whose low reading ability might interfere with C.A.I. in reading and mathematics.
- E.S.L. C.A.I. instruction is not grade bound, and the E.S.L. teachers select segments from the software and create their own sequences of topics. This, however,

is not easy since there are mechanical and technical constraints on altering software sequencing. The E.S.L. staff is involved in an ongoing effort to overcome these constraints.

- C.A.I. instruction for E.S.L. students does not include practice in spoken English.

CONCLUSION

The 1988-89 E.S.L. nonpublic schools program provided face-to-face instruction, C.A.I., and combination services to LEP students. E.S.L. teachers encouraged parent involvement in the program through the Read-Along program and Take-Home Activities. In addition, the program coordinator, field supervisors, and teachers participated in the Staff Development program, designed to enhance teachers' professional development.

III. PROGRAM IMPLEMENTATION

THE STAFF DEVELOPMENT PROGRAM: AN OVERVIEW

The goals of the E.S.L. Staff Development program in 1988-89 were to enhance the professional skills of teachers and to promote increased parental involvement in the education of their children. The program consisted of:

- formal and informal classroom observations by the program coordinator and field supervisors, including preobservation conferences between teachers and supervisory staff, when necessary, and postobservation conferences;
- small group meetings with informal discussions in the event of unscheduled nonpublic school closings; and
- workshops.

STAFF DEVELOPMENT WORKSHOPS

The staff development workshops provided the program coordinator, field supervisors, and teachers with the opportunity to meet and communicate about professional issues. Fifteen all-day workshops were held during the 1988-89 school year. A team of OREA observers attended five of these workshops from November to February. The following is a summary of the team's findings, based upon their observations, a review of workshop agendas, and other related materials.

The workshops were composed of presentations given by Chapter 1 E.S.L. supervisory and teaching staff and invited professionals in the field. The presentations were often accompanied by group discussions and hands-on activities. In addition, educational materials and supplies were shared and

distributed and teachers previewed and selected materials for their classes.

The workshops focused upon two major areas:

- instructional methods and tools; and
- parent involvement.

Attention was also given to issues related to computer assisted instruction (C.A.I.).

Instructional Methods and Tools

As part of last year's Staff Development program, teachers chose educational topics to research and produced summaries of their research. At this year's workshops, teachers broke into small groups to review these topics and plan classroom applications. Several teachers gave presentations demonstrating how these methods were translated into classroom activities and reported on how well the activities worked with their students. The methods presented included:

- writing process
- graphic organizers
- collaborative learning
- discovery learning
- notional/functional approach

Additional topics presented that were geared toward enhancing teachers' instructional practices included:

- "Rhythms to Reading" series
- questioning techniques
- Read-Along program

- cameras in the classroom
- communication arts coordinators conference

Parental Involvement: Take-Home Activities

In 1988-89, the E.S.L. Program instituted a new Take-Home Activities (T.H.A.) component to encourage parents to become actively involved in the program, reinforcing E.S.L. work at home. The T.H.A. were treated as a project-in-progress. Discussions about its effectiveness and suggestions for improvements in materials and methods were integrated into staff development workshops throughout the year.

Other issues explored in seeking to develop greater parental involvement were the following:

- developing strategies to reach out to non-English-speaking and nonliterate parents;
- exploring neighborhood resources available to the LEP child and adult; and
- planning successful parents workshops.

Computer-Assisted Instruction (C.A.I.). E.S.L. teachers who used computer assisted instruction received training by representatives of software systems. They also participated in regular staff development workshops and informal peer-group discussions centering on C.A.I. issues.

Conclusions

The workshops consistently focused on the staff development goals for 1988-89. Conceptual and practical information was presented in a detailed, well-organized manner. Research topics from the previous year were refined and expanded upon. In

addition, the Read-Along program, continued from previous years, received attention. The workshops were well-attended and participants were generally involved and responsive.

CLASSROOM OBSERVATIONS AND TEACHER INTERVIEWS

Introduction

In order to make a qualitative assessment of the implementation of the E.S.L. program and the impact of staff development, OREA evaluators conducted classroom observations and teacher interviews. OREA staff visited the same two teachers several times throughout the school year, in conjunction with the observations of staff development workshops. This focus on two teachers over a long period of time provided an in-depth examination of the linkages between classroom activities and staff development. One teacher at an M.I.U. and one teacher at a leased neutral site were observed and interviewed about staff development four times each from November 1988 to April 1989.

General Observations

Classroom environments. The classrooms observed were cheerfully decorated, displaying work by students; seasonal displays relating to subject matter; and various charts, maps, and displays reflecting the children's ethnicity.

Student participation. On the whole, the students observed were cooperative, and very attentive, and appeared anxious to participate. Most responded with lively interest to the teachers' questions, although a few were very shy and reluctant to contribute to class discussions. Students worked diligently

on independent tasks as well.

Teacher Interviews

OREA evaluators talked with the teachers observed about the influence of staff development on their classroom activities. Teachers spoke of the Staff Development program as most valuable, with powerful lasting effects. It was possible to continue using the methods presented from year to year and develop those ideas further. The teacher presentations at the workshops showed what worked in the classroom and suggested new ways of making things work better. On the whole, the teachers were very satisfied with the variety of areas covered by the workshops and the opportunity provided for sharing knowledge with other teachers and outside experts in the field.

Staff Development Implementation in Lessons Observed

The following staff development techniques were implemented in several of the lessons observed:

- notional/functional dialogues
- questioning techniques
- language experience
- "Rhythms to Reading" series
- the writing process, and
- sense/nonsense understanding.

THE READ-ALONG PROGRAM: TEACHERS' PERCEPTIONS

Twelve of the 31 E.S.L. teachers who used the Read-Along program in 1988-89 responded to a written survey, giving their perceptions of the program's implementation. They were very

positive about its impact on the students. The following are examples of changes teachers saw in their students which they attributed to participation in the program:

- improvement of reading skills
- vocabulary development
- increased enthusiasm for the reading process, and
- increased classroom participation.

Parents were described as being "appreciative" and "supportive" of the Read-Along program. As one teacher commented, "The parents love the program. Many of them follow along also and use this program to improve their English."

CONCLUSION

It was evident in the observations made by OREA evaluators that E.S.L. teachers used staff development training extensively in the classroom. The methods and activities drawn from staff development workshops were integrated with curriculum levels, providing intensive E.S.L. instruction. In addition, teachers were very positive about the impact of the Read-Along program on E.S.L. students.

IV. COMPUTER ASSISTED INSTRUCTION TEACHER SURVEY

Teacher Survey

A five-page survey (see Appendix B) was sent to all nine E.S.L. teachers at the end of the 1988-89 school year in order to gather information on their perceptions of the E.S.L. C.A.I. program. All nine teachers returned the survey. Of the two software packages that were used by these nine teachers, five of them used ESC and four used WICAT.

Teacher Experience

Seven of the nine E.S.L.-C.A.I. teachers had had extensive Chapter 1 teaching experience (ten or more years). None of them had had any experience with C.A.I. prior to the implementation of this program in 1987-88. Only one teacher was in her second year of C.A.I. The remaining teachers were C.A.I. novices.

Grade Levels and Teacher Assignment

Grades kindergarten through eight participated in the C.A.I. E.S.L. program, and the majority of students were in grades two through eight. Seven out of nine teachers were responsible for at least seven grade levels. This meant that teachers who were very familiar with their own lesson plans in face-to-face instruction at a variety of grade levels had to become acquainted with new, unfamiliar lesson contents contained in the computer software. The more grade levels a C.A.I. teacher was responsible for, the greater the task of becoming familiar with these lesson contents.

Teacher assignments included the following modes of

instruction:

- C.A.I.-only,
- combination services, and
- face-to-face instruction.

Six of the nine teachers had mixed assignments, which included students seen face-to-face as well as C.A.I. students. All six spent time at the Board of Education administrative center teaching C.A.I., as well as teaching students in face-to-face instruction. Only one teacher taught combination services and face-to-face instruction. The remaining three teachers taught combination services and spent their time at both the Board of Education administrative center and at neutral sites. This means that all of the C.A.I. teachers were in a position to contrast C.A.I. and face-to-face instruction.

Communication With Noninstructional Technicians and Students

Four teachers worked with only one noninstructional technician. The remaining five worked with two or three technicians since their students were spread out over more than one school. Teachers generally spoke to their technicians several times per week, for a variety of reasons. The two most frequently cited reasons were:

- to follow up on the solution of technical problems; and
- to verify student attendance.

Teachers had three ways to communicate with their students: by telephone, electronic mail, or face to face. Most teachers communicated with an average of 22 students per week.

Of the four teachers who taught combination services, three reported that their weekly face-to-face instructional day was their sole means of direct communication with their students. One teacher called students occasionally on the telephone at the computer room. None of these combination services teachers used electronic mail.

Of the five teachers who taught C.A.I. only, four relied solely on the telephone to communicate with their students. None used electronic mail and one did not report her method of communication.

When teachers were asked how they thought communication with their students and noninstructional technicians could be improved, four suggested additional conference time with their technicians and students. Other suggestions included:

- additional phones and computers; and
- posting computer lab schedules in the teacher computer rooms at the administrative center.

Software Generated Reports

Eight respondents believed the software-generated reports adequately tracked student progress, and one teacher did not. All nine respondents reported that principals in their schools were satisfied with the progress reports.

Two teachers reported that the questions most frequently asked by principals about reports dealt with report interpretation.

Previewing Lessons

In order for the Chapter 1 E.S.L. teachers to become familiar

with C.A.I. lesson contents, they must preview the students' lessons on the computers at the Board of Education administrative center. Teachers reported previewing from 36 percent to 78 percent of the lessons.

It can be inferred from this data that C.A.I. teachers have varying levels of familiarity with software contents.

Student Placement into the Software Curriculum

Since the E.S.L.-C.A.I. curriculum was composed of elements from other existing programs, none of the teachers used a computer placement test. Instead of the software tests, teachers reported placing students into the curriculum using standardized test results or the program-developed Oral Interview Test at the beginning of the school year. Initial placement into the software curriculum is important since students must work at an appropriate difficulty level in for learning to occur. If the initial placement is accurate, then less time will be taken up with finding the proper difficulty level at which students should be working. Thus, placement impacts not only on the amount of instructional time, but also on the benefit students derive from instruction.

Adjusting Software Difficulty Level

Although the software packages differ with respect to both instructional content and the way the content is organized (for instance, lesson modules may vary in length and groupings of subject matter), there is one organizational principle they share. That is, the lesson sequences should be determined by the

difficulty level of the material.

In addition to this organizational principle, the two software packages also have in common a principle of mastery learning. That is, a student must sufficiently master the information at one level of difficulty before moving on to the next. The level of mastery and the teachers' ability to adjust the level of mastery required to move from one lesson to another varies according to the software. Generally, about 80 percent or more of the questions in a module must be answered correctly for the student to move on. If a student consistently fails to meet the mastery criteria, or if the criteria are consistently exceeded, then the difficulty level of the lessons must be adjusted for learning to occur.

While it is possible for the software, in some cases, to make this adjustment automatically, automatic difficulty adjustments do not always meet the needs of the individual learner. Therefore, this is an area where Chapter 1 teachers can provide useful input to the learning progress. The teachers can monitor student progress by looking at printouts. Then, should it be necessary, they can fine tune the difficulty level of the students' lessons.

Teachers reported adjusting the software difficulty level from once a week to less than once a month. It is probable that the ongoing construction of the E.S.L. software segments complicates the adjustment of the difficulty level.

Responsiveness of Software Companies

Nine teachers rated the two software companies on their responsiveness to teachers requests and suggestions. Table 4 shows that the majority of teachers (seven out of nine) rated their software companies as somewhat to moderately responsive to teacher requests and suggestions. Only one ESC teacher gave a rating of very responsive.

Teacher Suggestions for Improving Lesson Content

Teachers' suggestions for improving lesson contents included:

- Reinforcement of basic skills should be improved.
- Less difficult reading material should be included.
- Concept development should be improved and needless repetition should be avoided.
- Programs should be less like workbook exercises.

Combination Services

One WICAT and two ESC teachers answered questions about C.A.I. combination services.

Use of Face-to-Face Instructional Time. Teachers reported using their face-to-face instructional time by following the curriculum of the Chapter 1 E.S.L. program. One teacher reported teaching new materials and reviewing software problems.

Differences Between C.A.I. and Face-to-Face Instruction

When teachers compared the face-to-face instruction with the C.A.I. instruction for combination services students, they offered the following main contrast:

- Face-to-Face instruction allows more interaction between students and allows them to respond aloud.

TABLE 4

Teacher Ratings of Software Companies' Responsiveness

Responsiveness	Number of Responses ESC (N=5)	WICAT (N=4)
Very Responsive to Requests and Suggestions	1	
Moderately Responsive	2	
Somewhat Responsive	1	4
Not At All Responsive	1	

- Seven out of nine teachers perceived their software companies as being somewhat to moderately responsive to their requests and suggestions.

COMPUTER-ASSISTED INSTRUCTION TEACHER SURVEY SUMMARY

Some of the key findings of the teacher survey are summarized below:

- While the majority of C.A.I. teachers had extensive Chapter 1 teaching experience, they were inexperienced with C.A.I.
- Most of the teachers had mixed assignments, which included C.A.I. as well as face-to-face students. This meant their time was divided between teaching at various instructional sites, and monitoring progress in C.A.I. from the Board of Education's administrative center.
- C.A.I. teachers communicated with noninstructional technicians several times a week to verify students' attendance, and to follow up on the solution of technical problems.
- C.A.I.-only teachers chiefly relied on the telephone to communicate with their students; combination services teachers relied chiefly on their day of face-to-face instruction.
- The majority of C.A.I. teachers (eight out of nine respondents) believed the software-generated reports adequately tracked student progress and all nine respondents reported that school principals were satisfied with the progress reports. However, principals' most frequently asked questions had to do with report interpretation.
- Teachers reported previewing from 36 percent to 78 percent of the lessons.
- None of the teachers used an initial computer placement test to place students into the curriculum.
- Teachers reported adjusting the difficulty level of the software from once a week to less than once a month.
- The majority of teachers rated their software companies as somewhat to moderately responsive to teacher requests and suggestions.
- In a comparison of combination services with face-to-face-only instruction, the differences noted were: greater interaction between students, and the opportunity to respond aloud for face-to-face students.

V. STUDENT OUTCOMES

ATTENDANCE

The average rate of attendance for the E.S.L. program was 93 percent.* A majority of the students, 61 percent, attended E.S.L. sessions two days a week, and 39 percent attended three or more days a week.

METHODOLOGY

The impact of the 1988-89 E.S.L. program on student achievement was determined by examining the change in participating students' performance on standardized tests from fall 1988 to spring 1989. The main objective for the program was a statistically significant mean gain from pretest to posttest.

To determine whether the program had reached this goal, raw scores were converted to N.C.E.s** for the LAB and TOBE, and statistical analyses were carried out on these converted scores. Raw scores on the OIT were analyzed without conversion to N.C.E.s, since the OIT is a criterion-referenced instrument. Correlated *t*-tests were computed to determine whether the mean gains were statistically significant.

Statistical significance indicates whether the changes in

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*Aggregate attendance information was provided to OREA by the Chapter 1 program administration.

**A zero N.C.E. gain represents growth that is about the same as would be expected from participation in the regular classroom alone. A positive N.C.E. gain is assumed to be a direct result of participation in the Chapter 1 program.

achievement are real or occur by chance. However, statistical significance may be exaggerated by a large sample size, or depressed by a small sample size.

To address the issue of whether achievement changes are important to the students' educational development, an effect size (E.S.)* is reported for each comparison. The effect size indicates the educational meaningfulness of each mean gain or loss, independent of the sample size.

Students in kindergarten and first grade took the Language subtest of the TOBE. Students in grade two took two LAB subtests: Reading and Writing, and Listening and Speaking. Students in grades three through eight took the LAB Reading, Writing, and Listening subtests. Students in grades kindergarten and one, and three through eight took the program-developed OIT as well.

The OIT, developed by the E.S.L. program staff, is designed to assess students' cognitive and linguistic skills. Pictorial stimuli elicit oral responses. The OIT is divided into four sections: a warm-up interview that is not scored, a section measuring listening comprehension, a section measuring the ability to repeat sentences with appropriate intonation, and a section measuring oral fluency in structured and unstructured settings. Students answered a total of 30 questions. Test

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* The E.S., developed by Jacob Cohen, is the ratio of the mean gain to the standard deviation of the gain. This ratio provides an index of improvement irrespective of the size of the sample. According to Cohen, .2 is a small E.S., .5 is a moderate E.S., and .8 is considered to be a large E.S. Only E.S.s of .8 and above are considered to be educationally meaningful.

results are reported in raw score units.

A comparison of pretest and posttest scores on these tests was made for students who received face-to-face instruction only and for those who received C.A.I. In addition, overall gains on the various tests were compared with overall gains for past years. Gains on the TOBE and the OIT for 1988-89 were compared with gains for the past three years. For grade two, overall gains on the LAB Reading and Writing, and Listening and Speaking subtests could not be compared with past years, since this was the first year these tests were administered. For grades three through eight, gains on the LAB Reading, Writing, and Listening subtests were compared with gains on those subtests for 1987-88. Finally, contrasts were made in mean gains for the three modes of instruction, face-to-face, C.A.I. and combination services.

Data were analyzed by grade for all students for whom pretest and posttest scores were available. However, statistical analyses could not be made for groups of students participating in the Read-Along program or Take-Home Activities, since these students were not randomly selected. In addition, statistical significance and effect sizes could not be computed for grades four through eight for students receiving computer-assisted instruction, due to the small numbers of participating students.

ACADEMIC ACHIEVEMENT FINDINGS FOR STUDENTS RECEIVING FACE-TO-FACE INSTRUCTION ONLY

In this section, the achievement results on the TOBE, OIT, and LAB subtests for E.S.L. students who received face-to-face only instruction will be presented.

Test of Basic Experience: Kindergarten and Grade One

The mean N.C.E. gains for kindergarten and grade one and the overall mean gain were statistically significant, satisfying the program's criterion for success. The major findings for the TOBE, shown on Table 5, are summarized below:

- The overall mean gain of 15 N.C.E.s (S.D.=15.7) was statistically significant and educationally meaningful.
- The mean gains for students in kindergarten and first grade were 17.7 N.C.E.s (S.D.=16.3), and 12.6 N.C.E.s (S.D.=14.8), respectively. These gains were statistically significant and educationally meaningful.

Language Assessment Battery Subtests: Grade Two

The mean N.C.E. gains for grade two on the Reading and Writing and Listening and Speaking subtests of the LAB were statistically significant, satisfying the program's criterion for success. The major findings for these subtests, shown on Table 6, are summarized below:

- The mean N.C.E. gain for grade two on the Reading and Writing subtest of the LAB, 23.3 N.C.E.s (S.D.=24.7), was statistically significant and educationally meaningful.
- The mean N.C.E. gain on the Listening and Speaking subtest, 22.6 N.C.E.s (S.D.=24.5), was statistically significant and educationally meaningful.

Language Assessment Battery Reading Subtest: Grades Three through Eight

The mean N.C.E. gains for all grades and the overall mean gain on the Reading subtest of the LAB were statistically significant, satisfying the program's criterion for success. The major findings for the LAB Reading subtest, shown on Table 7, are summarized below:

TABLE 5

Mean N.C.E. Differences on the Test of Basic Experience for E.S.L. Full-Year Kindergarten and Grade One Face-to-Face Students, 1988-89

Grade	N	Pretest		Posttest		Difference*		Effect Size
		Mean	S.D.	Mean	S.D.	Mean	S.D.	
K	458	10.8	12.8	28.5	16.2	17.7	16.3	1.1
1	548	13.2	12.3	25.8	16.9	12.6	14.8	0.9
Total	1,006	12.1	12.6	27.1	16.6	15.0	15.7	1.0

* Mean differences were statistically significant at the $p \leq .05$ level.

- The overall mean gain of 15 N.C.E.s was statistically significant and educationally meaningful.
- The mean gains were 17.7 N.C.E.s and 12.6 N.C.E.s for students in kindergarten and first grade.
- All effect sizes were educationally meaningful.

TABLE 6

Mean N.C.E. Differences on Subtests
of the Language Assessment Battery for
Second Grade Full-Year Face-to-Face Students
in the E.S.L. Program, 1988-89

		Pretest		Posttest		Difference*		Effect
Subtest	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Size
Reading & Writing	404	36.6	16.5	59.9	29.6	23.3	24.7	0.9
Listening & Speaking	434	21.7	11.3	44.3	26.9	22.6	24.5	0.9

* Mean differences were statistically significant at the $p \leq .05$ level.

- The mean gain of 23.3 N.C.E.s on the Reading and Writing subtest was statistically significant and educationally meaningful.
- The mean gain of 22.6 N.C.E.s for the Listening and Speaking subtest was statistically significant and educationally meaningful.

TABLE 7

Mean N.C.E. Differences for Full-Year Face-to-Face E.S.L. Students in Grades Three through Eight on the Language Assessment Battery Reading Subtest, 1988-89

		Pretest		Posttest		Difference[a]		Effect
Grade	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Size
3	137	37.4	13.4	48.1	15.9	10.7	14.5	0.7
4	54	29.4	19.0	38.5	21.6	9.1	17.6	0.5
5	62	20.4	17.7	30.3	21.0	9.9	13.6	0.7
6	40	28.6	13.8	38.9	17.0	10.3	13.4	0.8
7	40	21.4	13.6	30.1	13.3	8.7	9.5	0.9
8	29	22.9	16.3	36.4	23.9	13.5	20.9	0.6
Total	362	29.4	16.8	39.7	19.6	10.3	14.9	0.7

[a] Mean differences were statistically significant at the $p \leq .05$ level.

- The overall mean gain of 10.3 N.C.E.s was statistically significant and represented a moderate effect size.
- Mean gains ranged from 8.7 N.C.E.s for the seventh grade to 13.5 N.C.E.s for the eighth grade.
- The effect sizes for grades six and seven were educationally meaningful. All other effect sizes were moderate.

- The overall mean gain of 10.3 N.C.E.s (S.D.=13.4) was statistically significant and represented a moderate effect size.

- Mean gains ranged from 8.7 N.C.E.s (S.D.=9.5) for the seventh grade to 13.5 N.C.E.s (S.D.=20.9) for the eighth grade.

- The effect sizes for grades six and seven were educationally meaningful. All other effect sizes were moderate.

Language Assessment Battery Writing Subtest: Grades Three through Eight

The mean gains for all grades and the overall mean gain on the Writing subtest of the LAB were statistically significant, satisfying the program's criterion for success. The major findings for the LAB Writing subtest, shown on Table 8, are summarized below:

- The overall mean gain of 13.5 N.C.E.s (S.D.=20.0) was statistically significant and represented a moderate effect size.

- Mean gains ranged from 12.2 N.C.E.s (S.D.=19.5) for the sixth grade to 18.3 N.C.E.s (S.D.=19.2) for the eighth grade.

- The gain for the eighth grade was educationally meaningful. The effect sizes for all other grades were moderate.

Language Assessment Battery Listening Subtest: Grades Three Through Eight

The mean gains for all grades and the overall mean gain on the Listening subtest of the LAB were statistically significant, satisfying the program's criterion for success. The major findings for the LAB Listening subtest, shown on Table 9, are summarized below:

- The overall mean gain of 17.7 N.C.E.s (S.D.=22.7) was statistically significant and educationally meaningful.

TABLE 8

Mean N.C.E. Differences for Full-Year E.S.L. Face-to-Face Students in Grades Three through Eight on the Language Assessment Battery Writing Subtest, 1988-89

		Pretest		Posttest		Difference[a]		Effect
Grade	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Size
3	130	42.5	17.1	54.8	19.6	12.3	19.6	0.6
4	54	34.1	18.4	48.7	28.6	14.6	20.8	0.7
5	58	25.3	23.6	40.1	29.4	14.8	22.6	0.7
6	40	39.3	18.5	51.5	24.9	12.2	19.5	0.6
7	36	27.5	16.8	39.9	17.3	12.4	18.0	0.7
8	27	28.5	12.0	46.8	25.6	18.3	19.2	1.0
Total	345	35.3	19.5	48.8	24.5	13.5	20.0	0.7

[a] All mean differences were statistically significant at the $p \leq .05$ level.

- The overall mean gain of 13.5 N.C.E.s was statistically significant and represented a moderate effect size.
- Mean gains ranged from 12.2 N.C.E.s for the sixth grade to 18.3 N.C.E.s for the eighth grade.
- The gain for the eighth grade was educationally meaningful. The effect sizes for all other grades were moderate.

TABLE 9

Mean N.C.E. Differences for Full-Year E.S.L.
Face-to-Face Students in
Grades Three through Eight on the
Language Assessment Battery Listening Subtest, 1988-89

		Pretest		Posttest		Difference[a]		Effect
Grade	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Size
3	134	33.0	16.6	50.6	21.3	17.6	20.4	0.9
4	53	31.5	28.2	51.1	30.9	19.6	31.5	0.6
5	60	21.9	24.3	41.4	33.6	19.5	26.4	0.7
6	40	27.9	19.6	43.9	19.8	16.0	20.4	0.8
7	40	19.6	17.4	30.7	22.4	11.1	15.2	0.7
8	29	22.2	20.6	44.2	26.4	22.0	16.8	1.3
Total	356	27.9	21.3	45.6	26.3	17.7	22.7	0.8

[a] All mean differences were statistically significant at the $p \leq .05$ level.

- The overall mean gain of 17.7 N.C.E.s was statistically significant and was educationally meaningful.
- Mean gains ranged from 11.1 N.C.E.s for the seventh grade to 22 N.C.E.s in the eighth grade.
- Effect sizes for grades four, five, and seven were moderate. All other effect sizes were educationally meaningful.

Mean gains ranged from 11.1 N.C.E.s (S.D.=15.2) for the seventh grade to 22 N.C.E.s (S.D.=16.8) in the eighth grade.

- Effect sizes for grades four, five, and seven were moderate. All other effect sizes were educationally meaningful.

Oral Interview Test: Kindergarten, Grade One, and Grades Three through Grade Eight

The mean gains on the OIT for all grades and the overall mean gain were statistically significant, satisfying the program's criterion for success. The major findings for the OIT, shown on Table 10, are summarized below:

- The overall mean gain of 6.5 raw score points (S.D.=4.3) was statistically significant and educationally meaningful.
- Mean gains ranged from 5.9 points (S.D.=3.7) for the fourth grade to 7.6 points (S.D.=5.1) for the sixth grade.
- All effect sizes were educationally meaningful.

Comparison with Past Years

A comparison of the E.S.L. program data for 1988-89 with past years shows no substantial fluctuations in achievement levels on the TOBE, LAB Reading, Writing, and Listening subtests, and the OIT. A four year comparison was made for the OIT. A two year comparison was made for kindergarten and first grade on the TOBE, since up until 1987-88, total means were calculated to include the second grade. For the second grade, comparisons could not be made with past years, since previously students were tested with the S.A.T., while in 1988-89 students took LAB subtests. For grades three through eight, two year comparisons were made for the LAB Reading, Writing, and Listening subtests,

TABLE 10

Mean Raw-Score Differences for Full-Year E.S.L. Face-to-Face Students In Grades Kindergarten, One, and Three through Eight on the Oral Interview Test, 1988-89

Grade	N	Pretest		Posttest		Difference[a]		Effect Size
		Mean	S.D.	Mean	S.D.	Mean	S.D.	
K	457	3.3	3.0	9.6	5.4	6.2	4.5	1.4
1	546	7.0	4.3	13.7	5.4	6.7	4.2	1.6
3	137	12.1	5.9	19.0	5.8	6.9	4.3	1.6
4	54	12.3	7.8	18.2	7.3	5.9	3.7	1.6
5	63	11.3	8.5	17.9	7.4	6.6	3.6	1.8
6	40	11.7	7.4	19.3	4.9	7.6	5.1	1.5
7	39	9.8	7.8	16.2	7.6	6.4	3.7	1.7
8	29	11.7	7.2	18.1	6.3	6.4	4.7	1.4
Total	1365	7.0	5.9	13.5	6.7	6.5	4.3	1.5

[a] All mean differences were statistically significant at the $p \leq .05$ level.

- The overall mean gain of 6.5 points was statistically significant and educationally meaningful.
- Mean gains ranged from 5.9 points for the fourth grade to 7.6 points for the sixth grade.
- All effect sizes were educationally meaningful.

since these subtests were administered for the first time in 1987-88.

Test Of Basic Experience. A comparison of mean N.C.E. differences over two years, shown on Table 11, is summarized below:

- For 1987-88 and 1988-89 the overall mean gains for kindergarten and grade one were 15.7 N.C.E.s (S.D.=16.2), and 15.0 N.C.E.s (S.D.=15.7), respectively. These gains were statistically significant and educationally meaningful.

Language Assessment Battery Reading, Writing, and Listening Subtests. The two year comparison for students in grades three through eight on the LAB Reading, Writing, and Listening subtests shown on Table 12 are summarized below:

- On the LAB Reading subtest, the overall mean gain for 1987-88 was 9.7 N.C.E.s (S.D.=14.2). The overall mean gain for 1988-89 was 10.3 N.C.E.s (S.D.=14.9), a slight increase of 0.6 N.C.E.s from the previous year. These gains were statistically significant and represented moderate effect sizes.

- On the LAB Writing subtest, the overall mean gain for 1987-88 was 11.9 N.C.E.s (S.D.=19.3). The mean gain for 1988-89 was 13.5 N.C.E.s (S.D.=20.0), an increase of 1.6 N.C.E.s from the previous year. These gains were statistically significant and represented moderate effect sizes.

- On the LAB Listening subtest, the overall mean gain for 1987-88 was 15.9 N.C.E.s (S.D.=19.6). The mean gain for 1988-89, 13.5 N.C.E.s (S.D.=20.0), was 2.4 N.C.E.s smaller than the previous year's gain. These gains were statistically significant. The gain for 1987-88 was educationally meaningful, while the gain for 1988-89 represented a moderate effect size.

Oral Interview Test. A comparison of the overall mean gains on the Oral Interview Test for the past four years shows that these gains have remained stable. Table 13 shows that:

TABLE 11

Comparison of Mean N.C.E. Differences of Face-to-Face E.S.L. Students in Kindergarten and Grade One, on the Test of Basic Experience over Two School Years

Year	Number of Students	Mean Gain[a]	Standard Deviation	Effect Size
1987-88	1,009	15.7	16.2	1.0
1988-89	1,006	15.0	15.7	1.0

[a] These mean gains were statistically significant at the $p \leq .05$ level.

- Mean gains for the past two years have remained stable, with a difference of 0.7 N.C.E.s. They were statistically significant and educationally meaningful.

TABLE 12

A Comparison of Overall Mean N.C.E. Differences for E.S.L. Students, Grades Three through Eight, on the Language Assessment Battery Reading, Writing, and Listening Subtests over Two School Years

	1987-88 Difference				1988-89 Difference			
Subtest	N	Mean	S.D.	E.S.	N	Mean	S.D.	E.S.
Reading	390	9.7	14.2	0.7	362	10.3	14.9	0.6
Writing	385	11.9	19.3	0.6	345	13.5	20.0	0.7
Listening	388	15.9	19.6	0.8	345	13.5	20.0	0.7

* Mean gains were statistically significant at the $p \leq .05$ level.

- On the Reading subtest, the overall mean gain increased 0.6 N.C.E.s from 1987-88 to 1988-89.
- On the Writing subtest, the overall mean gain increased from 1987-88 to 1988-89 by 1.6 N.C.E.s.
- The mean gain on the Listening subtest decreased by 1.4 N.C.E.s from 1987-88 to 1988-89.
- On the Reading and Writing subtests, the effect sizes for both years were moderate. On the Listening subtest, the effect size went from educationally meaningful to moderate.

TABLE 13

Mean Raw Score Differences of E.S.L. Students[a] on the Oral Interview Test, Kindergarten through Grade Eight over Four School Years

		Difference[b]		
Year	N	Mean	S.D.	Effect Size
1985-86	3,871	6.6	3.8	1.7
1986-87	1,940	7.1	4.4	1.6
1987-88	1,799	6.8	3.9	1.7
1988-89[c]	1,365	6.5	4.3	1.5
1988-89[d]	235	6.0	3.2	1.9

[a]Grade two students did not take the OIT in 1988-89 and, therefore, are not included for that year.

[b]These mean differences were statistically significant at the $p \leq .05$ level.

[c]This gain was for face-to-face students.

[d]This gain was for C.A.I. students.

- Mean gains over the past four years have remained stable, statistically significant, and educationally meaningful. The smallest gain shown was for C.A.I. students in 1988-89.

- Mean raw score gains in 1985-86, 1986-87, and 1987-88 were 6.6 (S.D.=3.8), 7.1 (S.D.=4.4), 6.8 (S.D.=3.9), respectively. These gains were statistically significant and educationally meaningful.

- The mean gains for 1988-89 for face-to-face and C.A.I. students were 6.5 (S.D.=4.3), and 6.0 (S.D.=3.2), respectively. These gains were statistically significant and educationally meaningful. The smallest increase in gains was made by C.A.I. students in 1988-89.

ACADEMIC ACHIEVEMENT FOR STUDENTS RECEIVING COMPUTER-ASSISTED INSTRUCTION

The achievement results for students receiving computer-assisted instruction are reported below. In addition, achievement results will be compared for students receiving C.A.I. only, combination services, and face-to-face only instruction.

Test of Basic Experience: Kindergarten and Grade One

Mean N.C.E. gains for students in kindergarten and grade one and the total mean N.C.E. gains for C.A.I. students were statistically significant, satisfying the program's criterion for success. The major findings for the TOBE for C.A.I. students, shown on Table 14, are summarized below:

- The overall mean gain of 14.0 N.C.E.s (S.D.=18.2) was statistically significant and educationally meaningful.

- The mean gain for kindergarten students was 14.2 N.C.E.s (S.D.=17.5). This gain was statistically significant and educationally meaningful.

- The mean gain for grade one students, 13.9 N.C.E.s (S.D.=18.6), was statistically significant and represented a moderate effect size.

Language Assessment Battery Subtests: Grade Two

Overall gains for C.A.I. students were statistically

TABLE 14

Mean N.C.E. Differences for C.A.I.-E.S.L. Full-Year Kindergarten and Grade One Students on the Test of Basic Experience, 1988-89

Grade	N[b]	Pretest Mean	Pretest S.D.	Posttest Mean	Posttest S.D.	Difference[a] Mean	Difference[a] S.D.	Effect Size
K	57	19.3	16.5	33.5	16.3	14.2	17.5	0.8
1	116	12.1	12.3	26.0	17.7	13.9	18.6	0.7
Total	173	14.5	14.2	28.5	17.6	14.0	18.2	0.8

[a] All mean differences were statistically significant at the $p \leq .05$ level.

[b] Twelve kindergarten and 16 first grade students had missing information on their software packages.

- The overall mean gain of 14 N.C.E.s was statistically significant and educationally meaningful.

significant, satisfying the program's criterion for success. The major findings for the Reading and Writing and Listening and Speaking subtests of the LAB, as shown on Table 15, are summarized below:

- The mean gain of 11.8 N.C.E.s, (S.D.=23.1,) for students on the Reading and Writing subtest of the LAB was statistically significant and represented a moderate effect size.
- The mean gain of 21.6 N.C.E.s (S.D.=26.4) on the Listening and Speaking subtest was statistically significant and educationally meaningful.

Language Assessment Battery Reading Subtest: Grades Three through Eight

On the LAB Reading subtest, the mean N.C.E. gain for third grade students and the overall gain were statistically significant, satisfying the program's criterion for success. The major findings for C.A.I. students on this subtest, shown on Table 16, are summarized below:

- The overall mean gain of 6.5 N.C.E.s (S.D.=12.4) was statistically significant and represented a moderate effect size.
- The mean gain of 4.9 N.C.E.s (S.D.=11.9) for the third grade was statistically significant and represented a small effect size.
- Statistical significance and effect sizes could not be computed for grades four through eight, due to the small numbers of students.

Language Assessment Battery Writing Subtest: Grades Three through Eight

The overall gain on the LAB Writing subtest for C.A.I. students was not statistically significant and, therefore, did not meet the program's criterion for success. The major findings for this subtest, as shown on Table 17, are summarized below:

TABLE 15

Mean N.C.E. Differences for C.A.I.-E.S.L. Full-Year Second Grade Students on the Language Assessment Battery Subtests, 1988-89

Subtest	N[b]	Pretest Mean	Pretest S.D.	Posttest Mean	Posttest S.D.	Difference[a] Mean	Difference[a] S.D.	Effect Size
Reading & Writing	78	36.3	18.9	48.2	23.7	11.8	23.1	0.5
Listening & Speaking	79	22.4	10.6	44.0	28.6	21.6	26.4	0.8

[a]All mean differences were statistically significant at the $p \leq .05$ level.

[b]Five students had missing information on their software package.

- The mean gains for C.A.I. students on the Reading and Writing and Listening and Speaking subtests, 11.8 N.C.E.s, and 21.6 N.C.E.s, respectively, were statistically significant.
- The gain on the Listening and Speaking subtest was educationally meaningful.

TABLE 16

Mean N.C.E. Differences for Full-Year C.A.I.-E.S.L. Students, Grades Three through Eight, on the Language Assessment Battery Reading Subtest, 1988-89

Grade	N[a]	Pretest Mean	Pretest S.D.	Posttest Mean	Posttest S.D.	Difference Mean	Difference S.D.	Effect Size
3	29	38.7	10.6	43.7	15.8	4.9[b]	11.9	0.4
4	8	34.7	13.1	34.6	17.1	-0.1	15.0	n.a.
5	8	16.7	7.6	24.2	11.5	7.5	10.6	n.a.
6	4	23.2	12.8	29.0	4.8	5.7	10.9	n.a.
7	7	11.4	12.6	25.9	17.0	14.4	15.8	n.a.
8	7	23.3	12.7	35.6	13.7	12.3	6.7	n.a.
Total	63	29.7	14.9	36.2	16.4	6.5[b]	12.4	0.5

[a]Five students were missing information on their software package, 23 students used WICAT software, and 35 students used ESC software.

[b] These mean differences were statistically significant at the $p \leq .05$ level.

- The overall mean gain of 6.5 N.C.E.s was statistically significant and represented a moderate effect size.
- The mean gain of 4.9 N.C.E.s for the third grade was statistically significant and represented a small effect size.
- Statistical significance and effect sizes could not be computed for grades four through eight, due to the small numbers of students.

TABLE 17

Mean N.C.E. Differences for Full-Year C.A.I.-E.S.L. Students, Grades Three through Eight, on the Language Assessment Battery Writing Subtest, 1988-89

Grade	N[a]	Pretest Mean	Pretest S.D.	Posttest Mean	Posttest S.D.	Difference Mean	Difference S.D.	Effect Size
3	29	39.8	16.2	44.4	17.4	4.6	18.1	0.3
4	8	34.6	12.2	41.7	19.1	7.1	17.2	n.a.
5	8	17.6	12.3	28.7	14.4	11.1	12.9	n.a.
6	4	36.0	15.1	37.0	9.6	1.0	17.2	n.a.
7	7	22.6	12.2	40.4	27.7	17.7	20.8	n.a.
8	7	28.9	15.5	38.3	8.6	9.4	9.0	n.a.
Total	63	33.0	16.4	40.5	17.7	7.5	16.9	0.4

[a]Five students had missing information on their software package, 23 used WICAT software, and 35 used ESC software.

- The overall mean gain of 7.5 N.C.E.s was neither statistically significant nor educationally meaningful.
- The mean gain of 4.6 N.C.E.s for the third grade was neither statistically significant nor educationally meaningful.
- Statistical significance and effect sizes for grades four through eight could not be computed due to the small numbers of students.

- The overall mean gain of 7.5 N.C.E.s (S.D.=16.9) was neither statistically significant nor educationally meaningful.

- The mean gain of 4.6 N.C.E.s (S.D.=18.1) for the third grade was neither statistically significant nor educationally meaningful.

- Statistical significance and effect sizes for grades four through eight could not be computed due to the small numbers of students.

Language Assessment Battery Listening Subtest: Grades Three through Eight

The overall mean gain and the gain for grade three on the LAB Listening subtest for C.A.I. students were statistically significant, satisfying the program's criterion for success. The major findings for this subtest, as shown on Table 18, are summarized below:

- The overall mean gain of 14.4 N.C.E.s (S.D.=21.3) was statistically significant and represented a moderate effect size.

- The mean gain of 14.1 N.C.E.s (S.D.=24.2) for the third grade was statistically significant and represented a moderate effect size.

- Statistical significance and effect sizes could not be computed for grades four through eight due to the small numbers of students.

Oral Interview Test: Kindergarten, Grade One, and Grades Three through Grade Eight

The overall raw score gain and the gains for kindergarten and grades one and three on the OIT were statistically significant, satisfying the program's criterion for success. The major findings for C.A.I. students on the OIT, as shown on Table 19, are summarized below:

- The overall mean gain of 6.0 raw score points (S.D.=3.2) was statistically significant and

TABLE 18

Mean N.C.E. Differences for Full-Year C.A.I.-E.S.L. Students, Grades Three through Eight, on the Language Assessment Battery Listening Subtest, 1988-89

Grade	N[a]	Pretest Mean	Pretest S.D.	Posttest Mean	Posttest S.D.	Difference Mean	Difference S.D.	Effect Size
3	29	33.8	16.0	47.9	27.1	14.1[b]	24.2	0.6
4	8	44.5	26.4	45.5	15.5	1.0	25.7	n.a.
5	8	14.6	9.5	32.7	17.5	18.1	14.2	n.a.
6	4	17.7	9.2	36.0	18.4	18.2	16.1	n.a.
7	7	14.1	13.6	30.6	21.3	16.4	11.2	n.a.
8	7	19.7	19.0	42.6	29.9	22.9	18.0	n.a.
Total	63	28.0	19.3	42.4	24.2	14.4[b]	21.3	0.7

[a]Five students had missing information on their software package, 23 students used WICAT software, and 35 students used ESC software.

[b]These mean differences were statistically significant at the $p \leq .05$ level.

- The overall mean gain of 14.4 N.C.E.s was statistically significant and represented a moderate effect size.
- The mean gain of 14.1 N.C.E.s for the third grade was statistically significant and represented a moderate effect size.
- Statistical significance and effect sizes could not be computed for grades four thorugh eight due to the small numbers of students.

TABLE 19

Mean Raw-Score Differences by Full-Year C.A.I.-E.S.L. Students[a], Grades Kindergarten, One, and Three through Eight, on the Oral Interview Test, 1988-89

Grade	N[b]	Pretest Mean	Pretest S.D.	Posttest Mean	Posttest S.D.	Difference Mean	Difference S.D.	Effect Size
K	57	5.0	3.4	11.2	4.3	6.2[c]	3.6	1.7
1	115	7.2	5.0	13.0	4.8	5.8[c]	2.7	2.1
3	29	9.6	6.0	15.3	6.0	5.7[c]	2.8	2.0
4	8	12.2	6.3	19.6	5.5	7.4	5.9	n.a.
5	8	8.2	5.4	15.2	4.2	7.7	2.8	n.a.
6	4	7.5	3.7	15.2	4.2	7.7	2.8	n.a.
7	7	11.4	12.6	25.9	17.0	14.4	16.0	n.a.
8	7	11.4	6.9	17.4	6.6	6.0	2.4	n.a.
Total	235	7.3	5.2	13.3	5.3	6.0[c]	3.2	1.9

[a]Grade two students did not take the OIT in 1988-89.

[b]83 students used WICAT software, 119 used ESC software, and data was missing on the software package for 33 students.

[c]These mean differences were statistically significant at the $p \leq .05$ level.

- The overall mean gain of 6.0 N.C.E.s was statistically significant and educationally meaningful.
- The mean gains for kindergarten, and grades one and three were statistically significant and educationally meaningful.
- Statistical significance and effect sizes could not be computed for grades four through eight due to the small numbers of students.

educationally meaningful.

- The mean gains for kindergarten, and grades one and three, 6.2 (S.D.=3.6), 5.8 (S.D.=2.7), and 5.7 (S.D.=2.8), respectively, were statistically significant and educationally meaningful.

- Statistical significance and effect sizes could not be computed for grades four through eight due to the small numbers of students.

CONTRASTS OF MEAN GAINS FOR THREE MODES OF INSTRUCTION

Overall mean gains on all tests were contrasted for students receiving face-to-face instruction, C.A.I.-only, and combination services.

Kindergarten and Grades One and Two

The results of analyses of variance with Scheffe post-hocs for students in kindergarten through grade two, as shown on Table 20, are summarized below:

- In kindergarten and grade one the mean gains for face-to-face, C.A.I.-only, and combination services students were 15.0 N.C.E.s (S.D.=15.7), 16.0 N.C.E.s, (S.D.=19.6), and 11.6 N.C.E.s (S.D.=16.2), respectively. There was no statistically significant difference between any of these gains.

- On the Reading and Writing subtest, second graders receiving face-to-face instruction made a statistically significantly higher mean gain, 23.3 N.C.E.s (S.D.=24.6), than C.A.I.-only students who achieved a gain of 11.8 N.C.E.s (S.D.=21.7). There was no significant difference between mean gains for combination services students, 12.1 N.C.E.s (S.D.=26.9), and C.A.I.-only students.

- On the Listening and Speaking subtest, combination services students made a statistically significantly higher mean gain, 37.3 N.C.E.s (S.D.=27.8), than face-to-face students with a mean gain of 22.6 N.C.E.s (S.D.=24.5), and C.A.I.-only students with a mean gain of 15.2 N.C.E.s (S.D.=23.1).

These results seem to show that mode of instruction made no

TABLE 20

Comparison of Overall Mean N.C.E. Differences for Full-Year E.S.L. Students in Kindergarten and Grades One and Two Receiving Face-to-Face Instruction, C.A.I.-Only Instruction, and Combination Services on Norm-Referenced Tests, 1988-89

	Face-to-Face Instruction			C.A.I.-Only[b] Instruction			Combination[c] Services		
		Difference			Difference			Difference	
Subtest	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.
				Grades K and One					
TOBE	1006	15.0[a]	15.7	94	16.0[a]	19.6	79	11.6[a]	16.2
				Grade Two					
LAB Reading & Writing	404	23.3[a]	24.6	56	11.8[a]	21.7	22	12.1[a]	26.9
LAB Listening & Speaking	434	22.6[a]	24.5	56	15.2[a]	23.1	23	37.3[a]	27.8

[a]These mean differences were statistically significant at the $p \leq .05$ level.

[b]These totals include students using WICAT and ESC in all grades.

[c]These totals are for students using WICAT only in grade two. Kindergarten and grade one students used both WICAT and ESC.

- For students in grades kindergarten and one, analysis of variance with Scheffe post-hocs found no significant difference in mean gains between the three modes of instruction.
- For students in grade two, on the Reading and Writing subtest, analysis of variance with Scheffe post-hocs showed that face-to-face instruction produced the highest mean gain.
- For students in grade two, on the Listening and Speaking subtest, analysis of variance with Scheffe post-hocs showed that combination services produced the highest mean gain.

difference for kindergarten and first grade students; that face-to-face instruction was most effective for second graders' reading and writing achievement; and that combination services was most effective for second graders' Listening and Speaking achievement. However, since two software packages are differentially represented at each grade level and within each C.A.I. mode of instruction, these results are difficult to interpret.

Grades Three through Eight

Overall mean gains for students in grades three through eight were statistically significant in all three modes of instruction on the LAB Reading and Writing subtests. On the Listening subtest, gains were statistically significant for face-to-face and C.A.I.-only students, but not for students receiving combination services. The major findings for students in grades three through eight, as shown on Table 21, are summarized below:

- On the LAB Reading subtest, face-to-face students achieved a mean gain of 10.3 N.C.E.s (S.D.=14.9). Mean gains for C.A.I.-only students and students receiving combination services were 6.7 N.C.E.s (S.D.=12.5), and 5.9 N.C.E.s (S.D.=12.5), respectively. The differences between the three modes of instruction were not statistically significant.

- On the LAB Writing subtest, the largest mean gain, 13.5 N.C.E.s (S.D.=20.0), was achieved by face-to-face students. The gains made by C.A.I.-only students, 7.9 N.C.E.s (S.D.=16.3), was larger those that of students receiving combination services, 5.8 N.C.E.s (S.D.=19.5). These differences however, were not statistically significant.

- On the LAB Listening subtest, face-to-face students made a mean gain of 17.7 N.C.E.s (S.D.=22.7). C.A.I.-only and combination services students made mean gains of 15.5 N.C.E.s (S.D.=20.7), and 10.1 N.C.E.s

TABLE 21

Comparison of Overall Mean N.C.E. Differences for Full-Year E.S.L. Students in Grades Three Through Eight Receiving Face-to-Face Instruction, C.A.I.-Only Instruction, and Combination Services, on the Language Assessment Battery Tests, 1988-89

	Face-to-Face Instruction			C.A.I.-Only[b] Instruction			Combination[c] Services		
		Difference			Difference			Difference	
Subtest	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.
	Grades Three Through Eight								
LAB Reading	362	10.3[a]	14.9	51	6.7[a]	12.5	12	5.9[a]	12.5
LAB Writing	345	13.5[a]	20.0	51	7.9[a]	16.3	12	5.8[a]	19.5
LAB Listening	356	17.7[a]	22.7	51	15.5[a]	20.7	12	10.1	23.4

[a]These mean differences were statistically significant at the $p \leq .05$ level.

[b]These totals include students using WICAT and ESC in all grades except the sixth, which used ESC only.

[c]These totals are for students using WICAT only in grades three through eight.

- Analysis of variance with Scheffe post-hocs showed no statistically significant difference in mean gains between the three modes of instruction.

(S.D.=23.4), respectively. The differences between the three mean gains were not statistically significant.

While these results seem to indicate that mode of instruction made no significant difference in achievement on the Reading, Writing, and Listening subtests of the LAB, they are difficult to interpret for two reasons:

- Only 12 combination services students were both pretested and posttested.
- Two software packages are differentially represented at all grade levels and in both C.A.I. modes of instruction.

Oral Interview Test: Kindergarten, Grade One, and Grades Three through Eight

Comparisons of raw score gains on the OIT for students receiving the three modes of instruction (see Table 22) show that:

- The mean raw score gain of students receiving face-to-face instruction, 6.5 raw score points (S.D.=4.3), was significantly higher than the mean raw score gain for those receiving C.A.I.-only, 5.6 raw score points (S.D.= 2.9). It was not significantly different however, from the mean gain of 6.8 raw score points (S.D.=3.5) for students who received combination services.

The results of contrasting mean gains on the OIT are also difficult to interpret for the above-mentioned reasons.

TABLE 22

Comparison of Overall Mean Raw-Score Differences for Full-Year E.S.L. Students* Receiving Face-To-Face Instruction, C.A.I.-Only Instruction and Combination Services, on the Oral Interview Test, 1988-89

Face-to-Face Instruction			C.A.I.-Only[b] Instruction			Combination[c] Services		
Difference			Difference			Difference		
N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.
1365	6.5[a]	4.3	144	5.6[a]	2.9	91	6.8[a]	3.5

* Students in grade two did not take the OIT.

[a]These mean differences were statistically significant at the $p \leq .05$ level.

[b]These totals include students using WICAT and ESC in all grades except the sixth, which used ESC only.

[c]These totals are for students using WICAT only in grades two through eight. Kindergarten and grade one students used both WICAT and ESC.

- Analyses of variance for students in kindergarten and one, and grades three through eight on the OIT showed that gains made by students receiving face-to-face instruction and combination services were significantly higher than the mean gains of C.A.I.-only students.

VI. CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The major goal of the E.S.L. program is to enable LEP students to acquire the necessary cognitive, conceptual, and linguistic skills to improve their academic performance in their regular classes. The major objective of the 1988-89 program was that participating students would make statistically significant gains from pretest to posttest on standardized tests and on the OIT. An analysis of test results indicated that the E.S.L. program had a positive impact on student achievement and, on the whole, met the program criterion for success.

Face-to-Face Instruction

Program implementation. Site observations, review of program documents, and staff interviews all indicated that the E.S.L. program was being implemented as proposed:

- The goals of the program were addressed by the Chapter 1 teachers in their instructional strategies.
- Increased parental involvement was implemented for students in grade two through the new Take-Home Activities program and continued with 21 percent of all E.S.L. students in the Read-Along program.
- Responses to a teacher survey indicated that the Read-Along program had a positive impact on students' learning and that parents were highly supportive of the program.
- The staff development program offered in-depth coverage of conceptual and practical E.S.L. methods and teaching techniques relevant to the Chapter 1 program. Teachers implemented a rich repertoire of teaching strategies derived from staff development.

Student achievement. The overall mean gains on all the tests

for students receiving face-to-face instruction were statistically significant, meeting the program's criterion for success.

Comparison With Past Years. This year's overall mean gains generally showed continuing stability with overall gains from previous years. Gains remained statistically significant on all tests for all years compared.

Computer-Assisted Instruction

Program implementation. Site observation and staff interviews indicated that the instructional software used for C.A.I. must be adapted for use in settings where the Chapter 1 teacher is not present and that E.S.L. software needed special adaptation to the Chapter 1 curriculum. In addition, it was observed that a high level of teacher expertise with the C.A.I. systems is essential for effective remediation.

Adjusting the software difficulty level. Teachers have the ability to adjust the difficulty level of the software as they monitor instruction from the Board of Education administrative center; after examining printouts they can move students into harder or easier lessons.

Constructing a C.A.I.-E.S.L. curriculum. Since the E.S.L.-C.A.I. curriculum includes items from the reading and mathematics software, and these software packages only have audio components for the lower grade levels, this means that E.S.L.-C.A.I. at higher grade levels may not include an audio component.

Teacher expertise. WICAT Systems has developed a learning

model for teachers who use C.A.I., in which teachers progress through three stages of expertise. This highlights the necessity for Chapter 1 teachers to become expert users of C.A.I., if remediation at a distance is to be effective.

- Since the software companies' staff developers were not at the administrative center five days a week, and since the majority of teachers were teaching in face-to-face settings from one to four days a week, there is a good possibility that some teachers received more C.A.I. training than others. However, strong networking between the E.S.L. program teachers and staff may have compensated for this.

Student achievement. For all tests except the LAB Writing subtest, the overall mean gains for E.S.L. students receiving computer-assisted instruction were statistically significant. The overall gain on the LAB Writing subtest was not statistically significant and, therefore, did not meet the program's criterion for success. It should be noted that there were not enough students in grades four through eight to compute statistical significance.

Contrasts of Mean Gains for Modes of Instruction

In comparisons of students' gains for the three modes of instruction, for the majority of cases, no one mode of instruction led to significantly higher results on standardized tests. However, in cases where significant differences in mean gains did occur, these differences favored students receiving some face-to-face instruction*. These results are described

*The more positive impact of face-to-face instruction indicated here is reinforced by responses to the C.A.I. teacher survey. In their comparison of combination services with face-to-face only instruction, teachers noted that there was greater

below:

- For grade two students on the Reading and Writing subtest of the LAB, face-to-face instruction produced the highest mean gain.
- On the Listening and Speaking subtest of the LAB, combination services produced the highest mean gain.
- On the OIT, the mean raw score gain of students receiving face-to-face instruction was significantly higher than the mean raw score gain for those receiving C.A.I.-only.

It should be noted that the gains reported for combination services are of limited usefulness for grades three through eight, since only 12 of these students were both pretested and posttested.

RECOMMENDATIONS

Based upon these findings and other information in this report, the following recommendations are made:

Face-to-Face Instruction

- Since program objectives were met by all grades on all tests, staff development and classroom instruction should continue as currently organized.
- Expansion of the parental involvement programs should continue.

Computer-Assisted Instruction

- Face-to-face instruction gave students the opportunity to practice speaking aloud, while C.A.I.-only did not include this important element of E.S.L. instruction. To provide practice in speaking aloud, some face-to-face instruction is recommended, wherever possible, for E.S.L. students. This recommendation is also suggested by the positive findings for face-to-face only students.

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interaction between students and the opportunity to respond aloud for face-to-face students.

- Efforts should continue to adapt the instructional software for use in settings where the Chapter 1 teacher is not physically present.

- In the interest of helping teachers acquire the necessary expertise with the C.A.I. systems, software companies should adjust the schedules of their trainers to accomodate teachers who spend several days a week teaching in face-to-face settings.

- The impact of the absence of an audio component at the higher grade levels in E.S.L.-C.A.I. should be investigated.

APPENDIX A

Brief Description of Chapter 1 Nonpublic School Reimbursable Programs, 1988-89

Chapter 1 Nonpublic School Reimbursable programs provide supplementary, individualized instruction to students attending nonpublic schools in New York City. Students are eligible for Chapter 1 services if they live in targeted attendance area and score below a designated cutoff point on state-mandated standardized reading tests.

On July 1, 1985, the Supreme Court held that instruction by public school teachers on the premises of nonpublic schools--local educational agencies' most common method of serving Chapter 1-eligible children--was unconstitutional. As a result, alternative methods for providing Chapter 1 services to eligible nonpublic school students were devised. Students attending nonpublic schools now receive Chapter 1 services at mobile instruction units, public school sites, leased neutral sites, and nondenominational schools and via computer-assisted instruction in designated classrooms in nonpublic schools.

CORRECTIVE READING PROGRAM

The Corrective Reading program provides instruction in reading and writing. The goal is to enable students to reach grade level in reading. During 1988-89, the program served 7,943 students in grades kindergarten through twelve in 162 nonpublic schools. The total included 3,287 students receiving computer-assisted instruction and 4,656 students receiving face-to-face instruction. Program staff included a coordinator, three field supervisors, and 90 Corrective Reading teachers. Instruction was provided to small groups of students, one to five days per week, in sessions ranging from 30 to 60 minutes. Chapter 1 funding totaled $7.8 million.

READING SKILLS CENTER PROGRAM

The Reading Skills Center program provides instruction in reading and writing to students in grades four through eight. The goal is to enable students to reach grade level in reading. During 1988-89, the program served 176 students from four nonpublic schools. Program staff included a coordinator and seven teachers. Instruction was provided to small groups of about five students, three to five days per week, for sessions lasting from 45 to 60 minutes. Chapter 1 funding totaled $552,903.

CORRECTIVE MATHEMATICS PROGRAM

The Corrective Mathematics program provides instruction in mathematics. The goals are to deepen students' understanding of mathematical concepts and to improve their ability to perform computations and solve problems. During 1988-89, the program served 5,806 students attending 130 nonpublic schools. The total included 3,689 students receiving face-to-face instruction and 2,117 students receiving computer-assisted instruction. Program staff included a coordinator, two field supervisors, and 70 Corrective Mathematics program teachers. Instruction was provided to small groups of students, one to five days per week, in sessions ranging from 45 to 60 minutes. Chapter 1 funding totaled more than $5.4 million.

ENGLISH AS A SECOND LANGUAGE

The English as a Second Language program provides intensive English language instruction to limited English proficient students. The goal of the program is to help students gain the listening, speaking, reading, and writing skills necessary to improve their performance in school. During 1988-89, the program served 2,445 students in kindergarten through eighth grade in 69 nonpublic schools. Two thousand and twelve of these students received face-to-face instruction, and 433 of them computer-assisted instruction. In addition, a Read-Along component provided some students with tape recorders, storybooks, and audio tapes for home use. Program staff included a coordinator, two field supervisors, and 42 teachers. Instruction was provided to small groups of students, two to three days a week, in sessions ranging from 30 to 60 minutes. Chapter 1 funding totaled $2.7 million.

CLINICAL AND GUIDANCE PROGRAM

The Clinical and Guidance program provides diagnostic and counseling services to students enrolled in Chapter 1 nonpublic school programs--Corrective Reading, Reading Skills Center, Corrective Mathematics, and English as a Second Language. The goal of the program is to alleviate emotional or social problems that interfere with the students' ability to profit from remedial education. During 1988-89, the program served 5,707 students from 123 nonpublic schools. The staff included two coordinators, two field supervisors, 58 guidance counselors, 36 psychologists, one psychiatrist, and 12 social workers. Chapter 1 funding totaled $5.8 million.

OFFICE OF RESEARCH, EVALUATION, AND ASSESSMENT
INSTRUCTIONAL SUPPORT EVALUATION UNIT
E.C.I.A. - Chapter 1, NPS, C.A.I. 1988-89

TEACHER QUESTIONNAIRE

Computer Program _____ Subject (check one):
Corrective Mathematics____
Corrective Reading ____
ESL ____

I. Background Information
A. Teacher Experience
1. Years of Chapter 1 teaching experience_____
2. When did your very first C.A.I. class go online? Month _____ Year ____
3. Did you have previous C.A.I. experience (prior to the 1986-87 school year)?____Yes ____No
a) If yes, specify:_____

_____

4. Did you have previous experience with computers?____Yes____No
a) If yes, specify_____

_____

B. Students Served
1. Please check off/fill out whatever applies to you.

a)____CAI Only ____days per week _____ minutes per day

b)____Combination CAI Services: ____days per week ____minutes per day Face-to-Face: ____days per week ____minutes per day

c)____Non-C.A.I., Face-to-face only_____days per week _____minutes per day

2. Please list the number of C.A.I. students (including combination services)for whom you are responsible:

Grades: K____ 1____ 2____ 3____ 4____ 5____ 6____ 7____ 8____ 9____ 10____ 11____ 12____

3. Please list the number of non-C.A.I., face-to-face only students for whom you are responsible:

Grades: K____ 1____ 2____ 3____ 4____ 5____ 6____ 7____ 8____ 9____ 10____ 11____ 12____

4. How many schools do you work with in each of the following categories: C.A.I. only _____
Combination services_____
Face-to-face only_____

II Communication with C.A.I. Schools
A. Communication with NPS Principals and classroom teachers

What C.A.I. reports do you provide, and how often do you provide them, to principals and classroom teachers?

Reports	Provided to:	How Often?
_____	_____	_____
_____	_____	_____
_____	_____	_____

B. Communication with Non-Instructional Technicians
1. With how many Non-instructional technicians do you work?_____

2. How often do you speak to them?_____

3. Describe the purpose, (purposes) of a typical communication(s):

_____

_____

_____

_____

C. Communication with Students
1. What percentage of your communications with students are:

By Telephone _____%
By Computer Mail _____%
Face-to-Face _____%

_____

100%

2. On the average, with how many students do you communicate each week? _____

D. How can your communication with students and non-instructional technicians at C.A.I. sites be improved?_____

_____

_____

_____

III Perceptions of Software

A. Usefulness of reports

1. Are software-generated reports adequate for tracking student progress? _____Yes ____No

a) Is there any information about student progress which you would like added to the reports? _____

_____

_____

2. Are principals satisfied with the reports?____Yes ____ No

a) What is the most frequently asked question from a principal about a report? _____

_____

_____

B. Lesson Contents

1. Approximately what percentage of the C.A.I. lessons covered by your students have you had a chance to preview?_____

a) Approximately what percentage of your time do you use for previewing lessons?_____

2. Please rate the following software features:

	Excellent	Good	Fair	Poor
a) Factual accuracy	____	____	____	____
b) Appropriateness of lessons to program's educational objectives	____	____	____	____
c) Correlation of lesson contents with subject area's curriculum objectives	____	____	____	____
d) A developmentally logical approach to the sequencing of material	____	____	____	____
e) Explanations provided as a result of errors	____	____	____	____
f) Maintains student interest and motivation	____	____	____	____
g) Explanation of concepts and principles	____	____	____	____

h) Enchances problem solving and critical thinking ability ____ ___ ___ ___ ___
i) Graphics component ____ ___ ___ ___ ___
j) Audio component ____ ___ ___ ___ ___
k) Pacing of lessons ____ ___ ___ ___ ___
l) Reinforcement of concepts and skills ____ ___ ___ ___ ___
m) Reviews of lesson content ____ ___ ___ ___ ___

3. Does the software provide an initial placement test?___Yes___No
   a) If yes, have you used it?____Yes ____No
   b) If no, how did you place your students in the software curriculum? _____

_____

_____

_____

4. How often, on the average, do you have to adjust the difficulty level of the software? _____ Weekly
   _____ Bi-Monthly
   _____ Monthly
   _____ Less Often

5. How responsive is the software company to your requests and suggestions?
   ____Very ____Moderately ____Somewhat ____Not at all

6. What suggestions do you have for the improvement of lesson contents?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

IV. Combination Services Information

A. How do you utilize your face-to-face instructional time?

B. How do your C.A.I. teaching techniques and curriculum content differ from non C.A.I.?

C. Describe the quality and frequency of the feedback you receive regarding your students' computer-based learning.